The Great Storm - 25 years on

12 October 2012 - On 15 October 1987 a storm was brewing in the Bay of Biscay which was set to wreak havoc across southern parts of the UK.

It left 18 people dead and caused more than £1 billion of damage, sparking questions as to why there had been no warnings of what was to come.

The Met Office and other European forecasters had failed to predict the intensity of the storm, and it was clear forecasting capabilities at the time couldn't always predict such events.

This was a catalyst for a programme of investment and improvement in the science, technology and communication of forecasting which has transformed the way the UK responds to severe weather.

Ewen McCallum, Chief Meteorologist at the Met Office, said: "It sometimes takes your darkest hour for a professional organisation to learn lessons and we have learnt many lessons. The science, technology and the way we communicate has come a long way since 1987 - our whole game has been upped."

Science

The Met Office works together with leading international research centres to continue to improve understanding of weather phenomena and push the boundaries of forecasting to deliver ever-better accuracy.

As an example, one feature of the 1987 storm was the presence of 'sting jets'. This is where air from high in the atmosphere descends into weather systems to create an area of particularly strong winds at ground level.

At the time of the storm, however, no-one knew they existed or how they worked. Today they are well understood and represented in forecasting models so we can warn about them in advance.

Technology

The increase in the amount of data from satellites has played a pivotal role in weather forecasting. A recent Met Office study found that of all the observations used by weather forecasting models, satellites contributed about 65% to the performance of those models.

Supercomputing capability has also hugely advanced since 1987 - a crucial step in forecasting where trillions of calculations every second are required.

In 1987, computing capacity limited the resolution of the global model the Met Office used for weather prediction to gridboxes of 150 km. Now the model works at 25 km on a global scale, giving vastly improving resolution - like increasing the number of pixels on a digital camera. Furthermore at a local scale the gridboxes have been reduced to a size just 1.5 km, providing increased detail in our forecasts.

Additionally, unlike in 1987, we can now run multiple forecasts (called 'ensembles') which help us understand the probabilities involved in a forecast and warn of the risk of any severe weather occurring.

Communication

In the wake of the Great Storm of 1987 the Met Office set up the National Severe Weather Warning Services (NSWWS) to provide a co-ordinated way of delivering warnings to government, emergency responders and the public.

As part of this, we work closely with a host of organisations to make sure they have all the latest information on the weather so they can take appropriate action to safeguard life and property.

We also deliver our public forecasts in numerous different ways - such as our Android and iPhone apps - to help everyone stay up-to-date with our forecasts and warnings, wherever they are.

Forecasting severe weather today

All these changes have seen a big improvement in forecasting accuracy - our four day forecasts today are as accurate as our one day forecasts were in 1987. This means that we can now provide more advance warning when severe weather is expected to affect the UK.

This increase in accuracy, combined with our partnership working and the coordinated way we communicate our forecasts and warnings, means the UK can prepare and respond to severe weather.

In December last year we saw an example of all these improvements in practice. The Met Office forecast that a particularly ferocious Atlantic storm would affect parts of Scotland and issued a red Severe Weather Warning, the highest possible category.

Agencies acted on our advice; schools were closed, police warned people not to travel, emergency responders prepared for potential impacts, among many other preparations.

This preventative action undoubtedly minimised the impacts of the storm, which brought gusts of up to 164 mph and brought widespread disruption - but no-one was killed.

Sarah Davies, Senior Public Weather Service Advisor for the Met Office, said: "While a forecast can't stop all the impacts of the weather, this is an example of how advance warning can help minimise the disruption and help people stay safe."

Looking ahead

The Met Office is undoubtedly a world leader in weather forecasting but storms like those seen in 1987 and in 2011 still present significant forecasting challenges.

Improvements seen since 1987 are part of a continuing effort to push the boundaries of forecasting to provide ever better guidance, and that will continue into the future as we strive to improve the accuracy of our forecasts and warnings even further.

Contact information

Met Office Press Office: **+44 (0)1392 886655**

E-mail: Press Office

Met Office Customer Centre: **01392 885680**

If you're outside the UK: **+44 1392 885680**

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